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G.R. CULLEN & CO.

COMMONWEALTH OF AUSTRALIA  
PATENTS ACT 1952

DECLARATION IN SUPPORT OF AN  
APPLICATION FOR PATENT

In support of the application made by GLASS ENGINEERING PTY LTD,  
for a patent for an invention entitled  
PORTABLE HEATING DEVICE

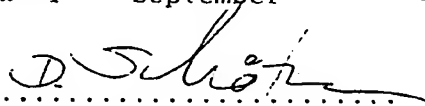
I/~~us~~ ..... Dietmar Schaefer .....  
of ..... 49 Bramston Street .....  
..... Tarragindi Qld 4121 .....

do solemnly and sincerely declare as follows:

1. I am/We are authorised by GLASS ENGINEERING PTY LTD, the applicant for the patent to make this declaration on its behalf.
2. .... Dietmar Schaefer..., of 49 Bramston St., Tarragindi., is/are the actual inventor(s) of the invention and the facts upon which the applicant is entitled to make the application are as follows:-

"The applicant is the assignee of the invention from the inventor"

DECLARED at Moorooka this 19th day of September 1989

  
.....  
Signature of Declarant(s)

TO: THE COMMISSIONER OF PATENTS  
AUSTRALIA.

1  
615106

COMMONWEALTH OF AUSTRALIA

The Patents Act 1952-1969

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COMPLETE SPECIFICATION FOR THE INVENTION ENTITLED:

PORTABLE HEATING DEVICE

The following statement is a full description of the invention including the best method of performing it known to us

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a nichrome element encased in a quartz tube) is positioned over the severed region and heat is applied until the thermoplastic polymeric intermediate layer softens sufficiently to enable the respective portions of the laminated glass be drawn apart thereby severing the intermediate layer.

A disadvantage of severing laminated glass lies in a step of severing the polymeric intermediate layer. This step is extremely slow and consumes unnecessary energy due to the inherently poor thermal conductivity of glass. Radiant heat must be applied to the region of transversely fractured glass for a minute or more until the thermoplastic polymeric intermediate layer has softened sufficiently to enable the sheets of glass on each side of the fracture to be drawn apart to sever the intermediate layer.

In many situations, laminated glass is cut on site before insertion into a window or other type of frame. Under these conditions, it is necessary for the heater to be portable so as to allow on-site heating and separation of the intermediate polymeric layer.

It is an object of the invention to at least partially overcome the abovementioned disadvantages.

In one form the invention resides in a portable heating apparatus for softening or melting the polymeric intermediate layer in laminated glass, said heating apparatus comprising

to extend along the entire width of the score line. However, if the laminated glass is of excessive width, the apparatus can be used to initially melt a portion of the intermediate polymeric layer and then be moved to the remaining portion of the laminated glass to melt the remaining portion of the intermediate polymeric layer. The length of the hollow elongate portion may be adjustable. The adjustment can be in the form of a number of telescopic tube sections or alternately of separate sections which can be attached to each other.

The hollow elongate body may be divided into a number of compartments by a web or other partition which extends longitudinally of said body. Preferably, the hollow elongate body is divided into an upper and lower compartment by a single web. The upper compartment is preferably of a larger dimension than the lower compartment and the lower compartment is preferably in the region of the tapered portion of the hollow elongate body. The upper and lower compartments are preferably in fluid communication with each other. The fluid communication may be in the form of a series of apertures extending along the length of the web separating the upper and lower compartments. Alternately, the fluid communication may be in the form of a single slot extending along the length of the web.

The pressurization means preferably comprises a tangential or radial fan which may be an electric or other

that both the pressurized means and heating means are electrically operated and are controlled by a switch or like control member.

5 The apparatus may be operated by a mains power supply or if necessary a portable power generator.

10 In use, pressurized air is supplied by the pressurization means to the upper compartment. The pressurized air can subsequently pass through the apertures or slots in the web to the lower housing where it is heated by the fluid heater. Subsequently, the heated fluid passes through the outlet aperture(s) as a narrow strip of heated air. The one or more outlet apertures can be positioned above a score line of the laminated glass to melt the intermediate polymeric layer. An advantage in having the  
15 hollow elongate body as a tapered oval configuration with the outlet aperture(s) at the tapered portion, is that this results in a maximum heating of the pressurised air flowing around the heating means and also guides the subsequently heated air through the outlet aperture(s).

20 In order that the invention may be more clearly understood reference is now made to a preferred embodiment of the invention in which figure 1 is a perspective view of a portable heating apparatus according to an embodiment of the invention.

25 The embodiment is directed to a portable heating apparatus 80 comprising a hollow elongate body 81 of

heating element 87 before issuing from the outlet slot 86 as a narrow strip of heated air.

5 A control switch 92 is provided to control the function of the air blower 91 or electric heating element 87 either individually or in combination.

10 In use, the portable heating apparatus is located above the break line of the laminated glass with the fluid outlet slot being closely spaced above the break. The apparatus is then turned on to supply a narrow strip of heated air into the break to soften and/or melt the intermediate polymeric layer.

A particular advantage of the portable apparatus is its ease of use with laminated glass cutting apparatus or in association with "free hand" cutting of laminated glass.

15 The portable heating apparatus of the invention permits on-site trimming or adjustment of pre-cut laminated glass panels where the on-site use of a laminated glass cutting apparatus is not possible or is inconvenient.

20 The apparatus replaces the use of flammable liquids for severing of the polymeric intermediate layer.

25 In an alternative embodiment of the apparatus, the heating means may comprise a plurality of spaced gas burner nozzles or the like, preferably with a radiant gauze to control gas flames and to permit even infra red radiation along the length of the apparatus. The pressurization means may comprise a source of pressurized fuel gas such as

**CLAIMS**



6. The apparatus as claimed in any one of the preceding claims, wherein said pressurization means comprises a fluid blower located at one end of said hollow elongate body.

7. The apparatus as claimed in claim 6, wherein said fluid blower comprises a tangential or radial fan.

8. The apparatus as claimed in any one of <sup>claims 2 to 7</sup> ~~the~~ preceding claims, wherein said heating means is located within said second compartment.

9. The apparatus as claimed in claim 8, wherein said heating means comprises an elongate heating element extending longitudinally of the second compartment.

10. The apparatus as claimed in any one of the preceding claims wherein spacing means is provided to space said one or more outlet apertures at a predetermined distance from a surface of a laminated glass sheet.

11. The apparatus as claimed in any one of the preceding claims including a control means to control the function of the pressurization means and the heating means either individually or in combination.

12. The apparatus as claimed in any preceding claim wherein said heating means is adapted to direct radiant heat from said one or more outlet apertures onto a predetermined area of a laminated glass sheet.



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